

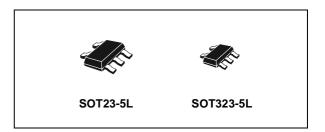
SINGLE 2-INPUT NAND GATE

- HIGH SPEED: $t_{PD} = 5.0$ ns (TYP.) at $V_{CC} = 5$ V
- LOW POWER DISSIPATION: $I_{CC} = 1\mu A(MAX.)$ at $T_A=25^{\circ}C$
- COMPATIBLE WITH TTL OUTPUTS: V_{IH} = 2V (MIN), V_{IL} = 0.8V (MAX)
- POWER DOWN PROTECTION ON INPUTS
- SYMMETRICAL OUTPUT IMPEDANCE: |I_{OH}| = I_{OL} = 8mA (MIN) at V_{CC} = 4.5V
- BALANCED PROPAGATION DELAYS: t_{PLH} ≅ t_{PHL}
- OPERATING VOLTAGE RANGE: V_{CC}(OPR) = 4.5V to 5.5V
- IMPROVED LATCH-UP IMMUNITY

DESCRIPTION

The 74V1T00 is an advanced high-speed CMOS SINGLE 2-INPUT NAND GATE fabricated with sub-micron silicon gate and double-layer metal wiring C²MOS technology.

The internal circuit is composed of 3 stages including buffer output, which provide high noise immunity and stable output.

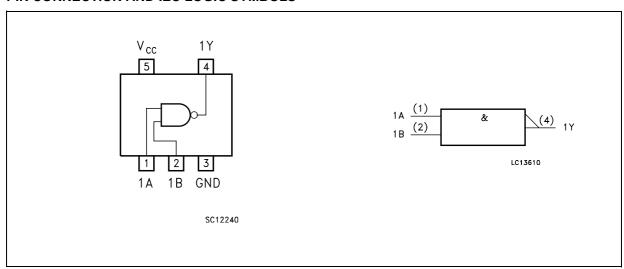


ORDER CODES

PACKAGE	T&R
SOT23-5L	74V1T00STR
SOT323-5L	74V1T00CTR

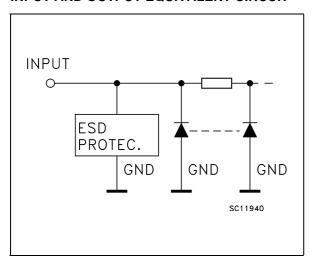
Power down protection is provided on all inputs and 0 to 7V can be accepted on inputs with no regard to the supply voltage. This device can be used to interface 5V to 3V.

PIN CONNECTION AND IEC LOGIC SYMBOLS



April 2004 1/9

INPUT AND OUTPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN N°	SYMBOL	NAME AND FUNCTION
1	1A	Data Input
2	1B	Data Input
3	GND	Ground (0V)
4	1Y	Data Output
5	V _{CC}	Positive Supply Voltage

TRUTH TABLE

Α	В	Y
L	L	Н
L	Н	Н
Н	L	Н
Н	Н	L

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	-0.5 to +7.0	V
V _I	DC Input Voltage	-0.5 to +7.0	V
Vo	DC Output Voltage	-0.5 to V _{CC} + 0.5	V
I _{IK}	DC Input Diode Current	- 20	mA
I _{OK}	DC Output Diode Current	± 20	mA
Io	DC Output Current	± 25	mA
I _{CC} or I _{GND}	DC V _{CC} or Ground Current	± 50	mA
T _{stg}	Storage Temperature	-65 to +150	°C
T _L	Lead Temperature (10 sec)	300	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	4.5 to 5.5	V
V_{I}	Input Voltage	0 to 5.5	V
Vo	Output Voltage	0 to V _{CC}	V
T _{op}	Operating Temperature	-55 to 125	°C
dt/dv	Input Rise and Fall Time (note 1) ($V_{CC} = 5.0 \pm 0.5V$)	0 to 20	ns/V

1) V_{IN} from 0.8V to 2V

DC SPECIFICATIONS

		1	Test Condition		Value						
Symbol	Parameter	v _{cc}		T _A = 25°C			-40 to	85°C	-55 to 125°C		Unit
		(V)		Min.	Тур.	Max.	Min.	Max.	Min.	Max.	
V _{IH}	High Level Input Voltage	4.5 to 5.5		2			2		2		V
V _{IL}	Low Level Input Voltage	4.5 to 5.5				0.8		0.8		0.8	V
V _{OH}	High Level Output	4.5	I _O =-50 μA	4.4	4.5		4.4		4.4		V
	Voltage	4.5	I _O =-8 mA	3.94			3.8		3.7		
V _{OL}	Low Level Output	4.5	I _O =50 μA		0.0	0.1		0.1		0.1	V
	Voltage	4.5	I _O =8 mA			0.36		0.44		0.55	
I _I	Input Leakage Current	0 to 5.5	V _I = 5.5V or GND			± 0.1		± 1.0		± 1.0	μΑ
I _{CC}	Quiescent Supply Current	5.5	V _I = V _{CC} or GND			1		10		20	μΑ
^{+l} cc	Additional Worst Case Supply Current	5.5	One Input at 3.4V, other input at V _{CC} or GND			1.35		1.5		1.5	mA

AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3ns$)

Symbol Parameter		Te	est Co	ndition				Value				
	Parameter	v _{cc}	CL	C _L (pF)	T _A = 25°C		-40 to 85°C		-55 to 125°C		Unit	
		(V) (pf	(pF)		Min.	Тур.	Max.	Min.	Max.	Min.	Max.	
t _{PLH}	Propagation Delay	5.0 (*)	15			5.0	7.0	1.0	8.0	1.0	9.0	no
t _{PHL}	Time	5.0 (*)	50			5.5	8.0	1.0	9.0	1.0	10.0	ns

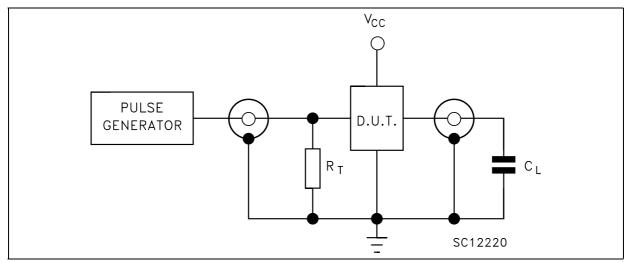
^(*) Voltage range is 5.0V ± 0.5V

CAPACITIVE CHARACTERISTICS

		Test Condition				Value				
Symbol	Parameter		Т	A = 25°	С	-40 to	85°C	-55 to	125°C	Unit
			Min.	Тур.	Max.	Min.	Max.	Min.	Max.	
C _{IN}	Input Capacitance			4	10		10		10	pF
C _{PD}	Power Dissipation Capacitance (note 1)			13						pF

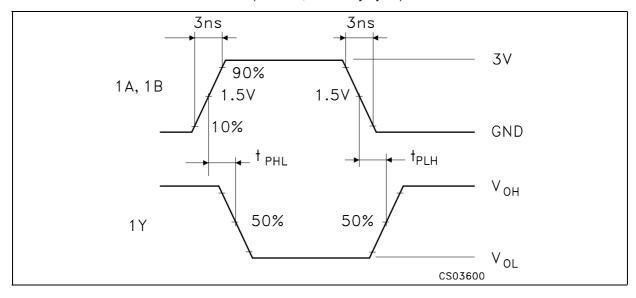
¹⁾ C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. I_{CC(opr)} = C_{PD} x V_{CC} x f_{IN} + I_{CC}

TEST CIRCUIT



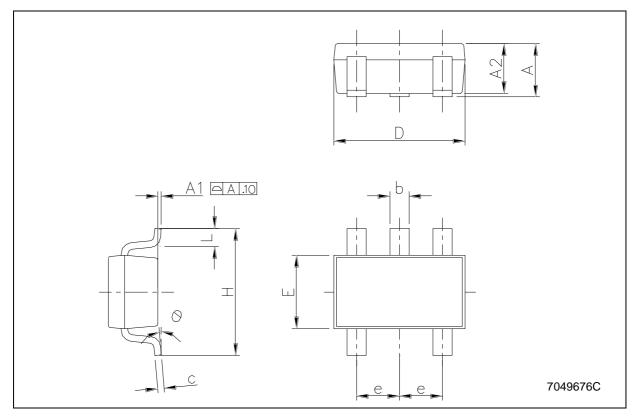
 C_L = 15/50pF or equivalent (includes jig and probe capacitance) R_T = Z_{OUT} of pulse generator (typically 50 Ω)

WAVEFORM: PROPAGATION DELAY (f=1MHz; 50% duty cycle)



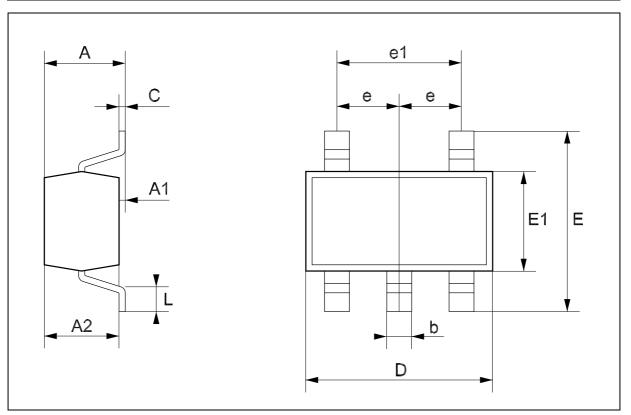
SOT23-5L MECHANICAL DATA

DIM		mm.			mils	
DIM.	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
А	0.90		1.45	35.4		57.1
A1	0.00		0.10	0.0		3.9
A2	0.90		1.30	35.4		51.2
b	0.35		0.50	13.7		19.7
С	0.09		0.20	3.5		7.8
D	2.80		3.00	110.2		118.1
E	1.50		1.75	59.0		68.8
е		0.95			37.4	
Н	2.60		3.00	102.3		118.1
L	0.10		0.60	3.9		23.6



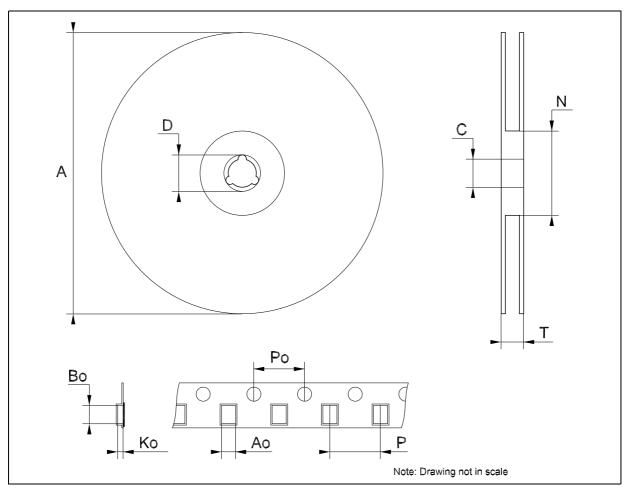
SOT323-5L MECHANICAL DATA

DIM		mm.		mils				
DIM.	MIN.	TYP	MAX.	MIN.	TYP.	MAX.		
А	0.80		1.10	31.5		43.3		
A1	0.00		0.10	0.0		3.9		
A2	0.80		1.00	31.5		39.4		
b	0.15		0.30	5.9		11.8		
С	0.10		0.18	3.9		7.1		
D	1.80		2.20	70.9		86.6		
E	1.80		2.40	70.9		94.5		
E1	1.15		1.35	45.3		53.1		
е		0 .65			25.6			
e1		1.3			51.2			
L	0.10		0.30	3.9		11.8		



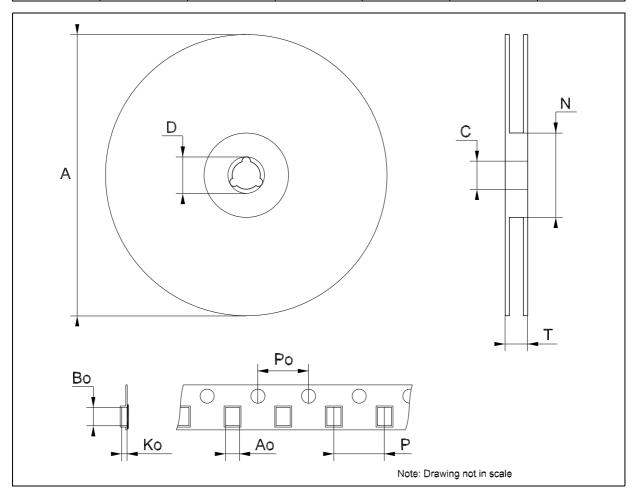
Tape & Reel SOT23-xL MECHANICAL DATA

DIM.		mm.		inch			
DIWI.	MIN.	TYP	MAX.	MIN.	TYP.	MAX.	
А			180			7.086	
С	12.8	13.0	13.2	0.504	0.512	0.519	
D	20.2			0.795			
N	60			2.362			
Т			14.4			0.567	
Ao	3.13	3.23	3.33	0.123	0.127	0.131	
Во	3.07	3.17	3.27	0.120	0.124	0.128	
Ko	1.27	1.37	1.47	0.050	0.054	0.0.58	
Po	3.9	4.0	4.1	0.153	0.157	0.161	
Р	3.9	4.0	4.1	0.153	0.157	0.161	



Tape &	Reel SOT323-xl	_ MECHANICAL	DATA
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DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
А	175	180	185	6.889	7.086	7.283
С	12.8	13	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	59.5	60	60.5		2.362	
Т			14.4			0.567
Ao		2.25			0.088	
Во		2.7			0.106	
Ko		1.2			0.047	
Po	3.98	4	4.2	0.156	0.157	0.165
Р	3.98	4	4.2	0.156	0.157	0.165



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